

**IN THE SPECIFICATION:**

*On page 1, prior to line 3, please insert the following headings and paragraph:*

**--Cross Reference to Related Applications**

This application is for entry into the U.S. national phase under §371 for International Application No. PCT/FI03/00033 having an international filing date of January 17, 2003, and from which priority is claimed under all applicable sections of Title 35 of the United States Code including, but not limited to, Sections 120, 363 and 365(c), and which in turn claims priority under 35 USC §119 to Finnish Patent Application No. 20020098 filed on January 18, 2002.

**Technical Field--**

*On page 1, prior to line 5, please insert the following heading:*

**--Background of the Invention--**

*On page 2, please amend the paragraph beginning at line 12 as follows:*

--The publication US 6 073 036 illustrates a mobile station with a touch sensitive input means and an automatic symbol magnification operation. A mobile station is provided with a touch sensitive input means, such as a touch sensitive display or a touchpad. The symbols or keys on a touch sensitive keypad can be implemented smaller in size, because the touched key is magnified so[[,]] that it can be distinguished before selecting it as an input. The magnification is implemented as if there would be a convex lens in the middle of the user and the screen. So the illusion seen by the user is non-linear magnification of the original symbol(s) touched. Subsequent detection of the tactile input and its location can be used for further magnification or for selecting the symbol. In this solution the whole used keypad, which can include for example numbers, alphanumeric characters or special characters, is depicted at a time. The size of one symbol in the screen is dependent on the resolution of the screen. After the magnification, all symbols are still depicted. The pointed, selected one(s) is (are) magnified by the expense of diminishing all the others. The non-linear, lens-like magnification of selected symbol(s) causes the decreasing of the other, non-selected symbols done in

proportion to their distance from the selected one(s).--

*On page 2, prior to line 29, please insert the following heading:*

--Summary of the Invention--

*On page 2, please amend the paragraph beginning at line 29 as follows:*

--The objective of the present invention is to implement a clear, well-designed and easily usable keyboard integrated in a small mobile device so[, ] that keys are distinguishable prior to selecting the input.--

*On page 2, please amend the paragraph beginning at line 32 as follows:*

--The objectives of the present invention are achieved so[, ] that a touch sensitive display provides a user interface and is used as an input and output means. Further the keys are zoomed in response to activation of the touch sensitive display to be clear and determinable.--

*On page 3, please amend the paragraph beginning at line 4 as follows:*

--The present invention is built on a basic assumption that a touch screen is used both for input and output. Data is besides seen and achieved by the display, also inputted through it or at least in very close relationship with objects shown on the display. The diminishing of the device is established by picturing the keys on the touch sensitive display. The two-way, interactive display contains means for zooming display information so that a zooming function makes individual keys distinguishable. This makes even a small device usable and convenient. The advantage is[, ] that the input means, such as a keyboard, can be zoomed on a display so that selected area of the keyboard is magnified for a predetermined range. Therefore it is possible to use originally small keys in usable size. This makes it possible to manufacture a small, simulated keyboard. At the same time it provides comfortable, convenient use of the known keyboard, which most users already are familiar with, such as normal typewriter or computer keyboard with keys arranged to be at their typical places.--

*On page 3, please amend the paragraph beginning at line 17 as follows:*

--Typically there is a touch sensitive layer on the basic display, such as LCD. The touch sensitive display can be used for all manual input from choosing function keys to writing sms-messages and navigating in the net. The touch sensitive display expresses both the actual display for user to get the normal output and the keypad, keyboard or some functional keys for user to gain means for input. The input part of the display may vary in size, shape and content in different applications and in different modes of function. For example if the device is used for phoning, the input needs mainly numerical keys and further the function key, which establishes the connection. If the user wants to send an sms-message, the most needed keys include letters known from the typewriting or computer keyboards. Some often used functions can be activated from dedicated keys. Some ~~[[rare]]~~ rarely used, mode specific functions can be presented in the display and activated from the adjacent keys.--

*On page 3, prior to line 29, please add the following heading:*

--Brief Description of the Drawings--

*On page 4, prior to line 3, please add the following heading and paragraph:*

--Detailed Description

In the following description of the various embodiments reference is made to the accompanying drawings, which form a part hereof, and in which is shown by way of illustration various embodiments in which the invention may be practised. It is to be understood that other embodiments may be utilized, and structural and functional modifications may be made without departing from the scope of the present invention.--

*On page 4, please amend the paragraph beginning at line 3 as follows:*

--In the following description of the present invention a central part is a touch sensitive display. It is obvious that it is not essential to the present invention[[],] which type of touch sensitive panel is used. Further the means for touching the panel to indicate a tactile input can vary from a finger to any auxiliary input means. The touch screens are sensitive to touch and

allow the user to interact with the device by touching items on the screen. A touch screen includes a touch screen panel, a controller and driver software. A touch screen panel is a transparent or translucent panel attached externally on the original display. The touch screen panel registers touch events and passes these signals to the controller. The controller then processes the signals and sends the data to the processor. Software drivers translate touch events for example into mouse- or key pressing events.--

*On page 5, please amend the paragraph beginning at line 22 as follows:*

--A touch detector 101 winnows out the actual touches from other interfering factors. It depends on a type of a touch screen, how the actual touches are separated from fault detections. If the touch screen panel is a resistive one, the panel is not ~~effected~~ affected by outside elements, such as dust and water, and the activation of the input point on the panel can be done by finger or by some auxiliary instrument. The ultrasonic wave touch screen panels can be damaged by outside elements and are also sensitive for example to background noise. The touch screen panels employing capacitive technology are not affected by outside elements. The capacitive screens must be touched with a finger.--

*On page 5, please amend the paragraph beginning at line 31 as follows:*

--A processor 107 receives commands from a discriminator 102 (and a keypress detector 104, if dedicated or soft keys exist). A discriminator 102 discriminates between different touch commands in a predetermined way. It identifies for example that a quick touch acts for command 'select' and a long stable touch acts for 'zoom', moving touch means 'pan', etc. The different ways of input are identified and used for differentiating their functions. Advantageously the input is to be performed in a way users already are familiar with from a former use of keyboards. The discriminating of different inputs can be implemented for example so that a discriminator 102 is integrated in processor 107, which calculates ~~times~~ time limits of touches or compares two detected, sequential locations of touches.--

*On page 6, please amend the paragraph beginning at line 14 as follows:*

--Figure 2 shows a method according to an advantageous embodiment of the present

invention. In this embodiment the zooming is done once and it is done always before the input is selected. This is implemented for example so[, ] that there is some predetermined time limit between steps, so that a constant tactile input first zooms and then activates a detected key. It is also common to select the input by releasing a touch. The checking of time limits is not shown in figure 2.--

*On page 6, please amend the paragraph beginning at line 20 as follows:*

--At first the display unit or the screen is divided into two portions in block 200 in some application specific way. The divided input and output areas are adjustable according to used application. This may be a user-adjustable feature so that the display size remains constant and the two screens may vary in size in relation to each other according to users commands. This kind of function is known from computer displays. According to the present invention the area can also be adjusted application specific so[, ] that a keypad-part or so called input part of the display allocates as small a display area as possible leaving maximum area of the display for the output part. This is advantageous when a user wants to use the display mainly for performing data, for example when reading sms-messages (short message service) or browsing data fetched from the Internet. On the other hand the user may maximize the keypad[[-]] or input area by minimizing the output area to be totally invisible, when only effective use of the input area is needed. In application specific, adjusting the area needed for the input part mainly depends [[of]] on the number of symbols or keys on a specific keypad, which can be for example numeric, alphanumeric or include only characters, function keys or all the mentioned. The actual number of keys that can be displayed at a time depends also on the resolution of the display. The individual symbols need to be visually distinguishable, before the user can select the input.--

*On page 7, please amend the paragraph beginning at line 3 as follows:*

--Next in block 201 it is checked[, ] whether the input area of the display is touched. The touch sensitive panel can inform the processor of an input or the processor can detect inputs for example periodically. It also depends on the type of the touch screen, how the detection of the touches is done in detail. Firstly a touch screen panel can be resistive, so it is coated with

thin, metallic, electrically conductive and resistive layer. In a resistive touch screen the touch is sensed as a ~~charge~~ change in electric current. Secondly a touch screen panel can be implemented with ultrasonic waves passing over the touch screen panel. When the panel is touched, portion of the wave is absorbed. So the change in an ultrasonic wave registers a position of a touch event. The third possible touch screen panel type is capacitive, which is coated with a material that stores electrical charges. In this solution the circuits are located in each corner of the panel. When touched, a small amount of a charge is drawn to the point of the contact. The type of the touch screen panel also affects to the means used for activating symbols on a display. Typically it is advantageous to use a finger, because it is easy to use. Additionally the device can contain some pointing means, such as a pen, for a fine adjustment.--

*On page 7, please amend the paragraph beginning at line 19 as follows:*

--If no touch or input event is detected in block 201, the detection is searched again or waited for. The block 201 also includes the discrimination of different functions. In this embodiment the discriminating operation depends on a current mode of a device. If the touch is detected in block 201, the current mode of the display is examined. If the display view is not zoomed in block 202, the zooming is done according to a block 203. The zooming is implemented so[[,]] that the activated[[,]] touched portion of the displayed keyboard is magnified and the rest of the keyboard is not seen at all. The magnified area is the area touched by a user and a certain area surrounding it. In this magnified area the keys and symbols are distinguishable and a user can easily determine and select a key or a symbol. If the display view is already zoomed in block 202, the operation continues according to the block 204.--

*On page 8, please amend the paragraph beginning at line 3 as follows:*

--The above is only one embodiment of the present invention and many modifications may be made in the scope of the invention. According to one embodiment of the present invention after the touch is detected in the step 201, the discriminator (102 in fig.1) ~~aparts~~ imparts a zooming event from for example a sizing of windows, such as adjusting the size of an input or an output portion of the touch sensitive display. Typically window sizing and panning events are indicated by sliding a tactile input mean on the display. The zooming can then be identified from the stable, non-moving touch or from round moving touch. Basically this can

be implemented by detecting two sequential positions of a touch and checking, if there is a difference between the places. According to the above described embodiment accompanied by the figure 2, the zooming always takes ~~always~~ place before the selection of the input. In this embodiment the mode of a display is checked: if zooming is not done, it is implemented in step 203, after the zooming is done, the detected touch indicates the selected input. It should be noted that the zooming can be done more than once. If the first view is for example the whole typewriting keyboard, for example for editing an sms-message, the zooming can be advantageously done two or three times in order to get a view of visually distinguishable, recognisable keys. On the other hand the input of numbers from the numeric keypad can be done faster, if the zooming is done only once. According to one advantageous embodiment a user has an opportunity to choose the input key or symbol without any zooming or magnification. A user can use some auxiliary means, such as a pen or stylus, to point out a small key. The magnification may be implemented in sequential steps or it can be done stepless until a continuous touch sustains. The stepless magnification may be implemented so[[,]] that there actually are very small magnification steps and those are produced and presented sequentially fast enough for user to get an impression of continuous presentation.--

*On page 8, please amend the paragraph beginning at line 28 as follows:*

--Further one affecting feature is the dimension of the magnification. The dimension or magnification rate is typically predetermined and it may be a keypad specific feature, specified by an application or a mode, or the dimension can be determinable by a user. ~~Display~~ A display with numbers of small keys and details must be magnified so much, that the using is comfortable. Also it must be kept in mind that if the magnification is multiplex or the original keypad has less and larger keys, a multiple magnification may cause only one or few keys to be visible on the screen. This is not usually convenient for the user, because the magnified area can be ~~miss-selected~~ mis-selected, after which the correction is easier and faster to do, if also the adjacent keys are visible.--

*On page 9, please amend the paragraph beginning at line 3 as follows:*

--Typically the present invention is implemented so[[,]] that [[a]] portions of the original keyboard can be viewed in magnified mode just by sliding a finger or other touch means to a

side edge of the viewed keyboard portion. Touching to the side of the viewed keypad makes the view [[to]] scroll. This is most advantageous for users, who are familiar with the original keypad, so they will know what keys will come up next, beside the viewed ones. The users unfamiliar with used keypads can either scroll around on a keypad and find the symbol they are looking for, or alternatively go back to a non-zoomed mode and start the zooming again on a selected area.--

*On page 9, please amend the paragraph beginning at line 11 as follows:*

--The touched symbol or key is highlighted in a block 205 as a visual sign of a selected key to a user. In a block 206 the actual selection of a key, such as a letter or a number, or activation of a function or a soft key can be indicated in few ways. The typical way is to release the touch, when the wanted key is highlighted. Another possible way to select and activate the wanted key is to keep the touch fixed in one place on a selected key a predetermined time, for example a few seconds. Also according to an advantageous embodiment if the sensed pressure on the screen exceeds some limit value, the key is activated. It is obvious to a person skilled in the art, that there are many ways to implement the present invention.--

*On page 10, please amend the paragraph beginning at line 1 as follows:*

--Now the user wants to produce an sms-message, in particular the user wants to input a letter D. The viewed keyboard is arranged in the same order as an original typewriter keyboard. Many users are familiar with these typical keyboards from computers and laptops, so a typical user knows in some accuracy where the wanted letter 'D' is situated in the keyboard. The user points roughly to the area that the wanted letter is situated. The touch point of a user in figure 3a is situated on the letter 'D'.--

*On page 10, please amend the paragraph beginning at line 7 as follows:*

--In figure 3b the detected touch point of the keyboard is zoomed as shown in keyboard portion 302b. The selection can advantageously be done just by putting a finger, or some pointing mean, on a touch screen. [[User]] The user can set up the speed of zooming, which



advantageously is set from a few milliseconds to a few seconds. While zooming the keyboard, a user can define his search by moving a pointer on the touch screen panel. A chosen key is for example highlighted to give the user a visual feedback of a current, active selection. A key can be selected to be the input by releasing the touch off the touch screen, when the specific key is selected. Otherwise the pointer is positioned again roughly on the area to be zoomed, in this embodiment the area surrounding the letter 'D'.--

*On page 10, please amend the paragraph beginning at line 17 as follows:*

--Figure 3c illustrates the touch screen 302c after the keyboard is magnified or zoomed for a second time. The keys are now advantageously at the minimum the size of 7 x 7 millimeters, which corresponds to the average size of a finger tip. There are also edges 305 rounding the keyboard. Because only few keys are seen, the user can scroll the keyboard by moving a pointer to the selected side on the edge. Now the letter 'D' is selected by lifting the pointer off from it, when it is highlighted. The letter 'D' is then inputted to the display portion 301 above. After the input, the magnified, zoomed keyboard 302c can be used in magnified mode or returned to original mode, in which the whole keyboard can be seen, as illustrated in figure 3a.--